

2. An average man requires about 200mg of riboflavin (vitamin B2) per day. How many tablespoons of cheese would a man have to eat each day if this was the only source of riboflavin and if mozzarella cheese contained 5.5 mg. of riboflavin per gram? The density of mozzarella cheese is 68.93 grams per dL. (1TBS = 15mL)

3. If 1.0g of silver can be converted into 400.0 square feet of mirrors, how thick is the coating in millimeters. The density of silver is 105 dg/cm³.

$$D = \frac{m}{V} \quad \frac{m}{D} = V \quad V = L \times W \times H \quad H = \frac{V}{LW} \quad H = \frac{m}{DLW}$$

$$1.0g \left(\frac{10dg}{1g} \right) \left(\frac{1cm^3}{105dg} \right) \left(\frac{1in}{2.54cm} \right)^3 \left(\frac{1ft}{12in} \right)^3 \left(\frac{1}{400.0ft^2} \right) \left(\frac{12in}{1ft} \right) \left(\frac{2.54cm}{1in} \right) \left(\frac{10mm}{1cm} \right) = \boxed{2.6 \times 10^{-6} mm}$$

4. The diameter of metal wire is often referred to by its American wire gauge number. A 20-gauge wire has a diameter of 0.03196 inches. How many meters of wire are present in a 3.0 pound spool of 20-gauge copper wire? The density of copper is 8.92 g per mL. (volume of a cylinder = $\pi r^2 l$ where l =length)

$$D = \frac{m}{V}$$

$$V = \frac{m}{D} \quad 3.0lb \left(\frac{1kg}{2.2lb} \right) \left(\frac{1000g}{1kg} \right) \left(\frac{1mL}{8.92g} \right) \left(\frac{1cm^3}{1mL} \right) \left(\frac{1in}{2.54cm} \right)^3 \left(\frac{1}{\pi} \right) \left(\frac{2}{0.03196in} \right)^2 \left(\frac{2.54cm}{1in} \right) \left(\frac{1m}{100cm} \right) =$$

$$V = \pi r^2 l$$

$$l = \frac{V}{\pi r^2} \quad r = \frac{d}{2}$$

$$\boxed{92.8m}$$

5. It is known that 400.0 pounds of iron metal occupy a volume of 0.02234 cubic meters. Calculate the radius in meters of an iron sphere that has been determined to contain 54.5 kilograms of iron.

$$D = \frac{m}{V}$$

$$V = \frac{m}{D}$$

$$\sqrt[3]{54.5kg \left(\frac{2.2lb}{1kg} \right) \left(\frac{0.02234m^3}{400.0lb} \right) \left(\frac{3}{4} \right) \left(\frac{1}{\pi} \right)} = \boxed{r = 0.117m}$$

$$V = \frac{4}{3} \pi r^3$$

$$r = \sqrt[3]{\frac{3V}{4\pi}}$$